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*Linus Andersson & Erik Kumm, skogsmästarprogrammet 01/04*

*Handledare: Folke Bohlin*

# LOGGING COMPANIES IN ESTONIA

## PREFACE

This thesis was undertaken as a response to a demand for knowledge by the Nordic Council on Forest Operations Research (NSR).

The work has provided us with many interesting impressions of Estonia and the Estonian forestry. It has also given us the possibility to learn more about working in other countries.

To facilitate our own writing situations, separate reports have been written by us in Sweden and the students in Estonia. In our report Erik Kumm has been primarily responsible for the writing of the Preface, Summary, Introduction, Material and Methods, Discussion, Result chapters Company, Employees, Stora Enso and the summary in Swedish. Linus Andersson has been primarily responsible for writing of the Result chapter Production and the Estonian forestry, Estonian forest history and Estonian state forest (RMK) chapters in the Introduction.

The work in Estonia was done together with two Estonian forestry students, Jaak Raid and Taavi Petersell from Faculty of Forestry, Estonian Agriculture University. Without their help and knowledge it would not have been possible to carry out our examination work. To facilitate our own writing situations, separate reports have been written by us in Sweden and the students in Estonia. We would also like to thank our supervisor Dr Folke Bohlin, Department of Forest Products and Markets SLU Uppsala. We are also grateful to the forest officer Esbjörn Andersson, Forest Engineer School, SLU Skinnskatteberg for his early contacts with the Faculty of Forestry, Estonian Agriculture University.

Our work was made possible thanks to scholarships and grants from Skogsmästarförbundet, Skogsakademikerna, Agrifack, LRF Skogsägarna and VMF Qbera. Without their help, this work would not have been economically possible.

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# SUMMARY

This thesis is exploratory by its nature, there is hardly any literature on Estonian logging companies available in English. Our knowledge on Estonian logging companies was in the beginning small. We chose to use a qualitative method that can make us understand lines of action and reasoning. We base our findings on interviews with companies using relatively modern, semi- or fully mechanized logging systems. The interviews were made by us and with the help the two Estonian forestry students. The interviews were made at the companies office. We did 9 interviews, mostly with the owner or the company manager of the company. The interviewed companies represent a yearly cut of 700.000 $m^3$, a substantial portion of the yearly harvest which is 4 million $m^3$ in Estonia (Swedish forest statistics yearbook 2003). Our results are indicative, showing the situation of Estonian companies with modern mechanized systems.

We have also interviewed Stora Enso in Estonia. Stora Enso in Estonia owned logging companies that were logging for them. Now those logging companies have been sold out and are hired as contractors.

The thing that makes the interviewed logging companies special is that they have a very broad working area. It would probably be better to call them "forest companies", meaning a company that works with most operations in the forest. They do almost everything from logging and secondary transport to wood processing and wood trading. Many of the companies own their own forest and have forest management as a big part of their business.

What we found the most surprising was how modern the machinery is in Estonia. The primary reason for this is that after the Estonian independence from the Soviet Union, international forest companies, bought Estonian logging companies to be able to log for their own industries. The international forest companies modernized the machinery to make the logging more rational. There are also domestic logging companies that have the same modern machinery. The foreign ownerships are on their way to disappear by selling their investments to domestic owners. The main reason why the foreign owners are selling is that they do not want to bind up capital in machinery. The foreign owners also believe that the standard and quality of the logging and the contacts with the forest owners will increase due to competition among the many new domestic logging companies.

The primary problems that the interviewed logging companies have mentioned in our interviews are the tax law, forest law and finding employees with good work ethics. According to the companies, the high taxes are promoting a black market, which is impossible for the legal companies to compete with. The biggest problem with the forest law is the restrictions on the size and shape of the logging area. This results in a more expensive logging and a less rational division of the forest. There is also the logging ban, 15 April to 15 June, in state owned forests. There is also a problem with alcoholism among the employees in many of the companies.

Most companies have a positive outlook on the future. However, some of the foreign owned companies are concerned about the future and do not really know what the future will bring. Still, most of the companies have some kind of idea how to develop their company. Most companies are keen on the idea of expanding their operations by adding more forestland, or bigger working area, some want to increase the volume of logged timber.

# 1 INTRODUCTION

## 1.1 Objective

When the Soviet Union broke down in 1991, Estonia became liberated and got a market economy.

The technical development in the logging sector has followed the general pattern of development in Estonia and thus gone very fast, which raises the question: Have the new Estonian logging companies been able to keep up with the rapid changes?

How is the company structure of the logging companies, what kind of machinery is used, what kinds of problems are there and what kinds of development needs are there.

One hypothesis may be that the logging companies have procured second-hand machinery. Another may be that they have bought new harvesters and forwarders and are quickly adapting and learning to use all their capacity. A third one may be that they have bought new machinery but are unable to fully use them. If so, is the reason for the problems encountered that the forest machine operators have insufficient educational levels or are there other reasons?

Our objective for this study is to investigate, analyze and develop a reasonably accurate picture of (*cf. Skog Forsk Paper*) the present state, problems and the need of R&D of the logging companies.

We focus on contractors that are using relatively modern, semi- or fully mechanized logging systems. This kind of logging companies are the ones that provide the industries with large quantities of wood and they are therefore the most interesting from an economic point of view.

## 1.2 Estonian forest history

The chapters on Estonian forestry are largely based upon www.rmk.ee and www.ess.slu.se
Some important milestones in Estonian forestry, in 1802 when the first forest act was created in Russia. There it was stated that 11-12 % of Estonia was covered with forest and that state forest should get more attention.
1888 a new act was issued, in this the attention was more directed to protecting the forest. For example the act did not allow cutting of living trees. This act included all forest owners.
When Estonia became independent from Russia 1918 they used the Russian forest act in the beginning, but in 1919 some additional rules where added, these rules were more applied for Estonia then Russia.
In 1934 Estonia got their first own forest act. In this act the part concerning private forest owners was rather weak but the state forest chapter was described in detail. 1940 Russia once again controlled Estonia and also the forest so the Russian forest act was introduced again.
When Estonia became independent from the Soviet Union, in 1991, a property and land reform was initiated in Estonia. This means that the land that formerly was owned by individual landowners in Estonia should be given back to them from the government. 40 - 50% of the forest land, owned by the state, is therefore changing hands back to the people. The average size of forest plots, held by private owners, is approximately 14,3 ha.
In 1993, two years after the independence from Russia, a second forest act was made and it was very similar to the first act from 1934.
During 1997 a big group of experts came together to create a new forest policy for Estonia and in 1998 the new forest act became valid in Estonia.

## 1.3 Estonian forestry

Estonia belongs to the northern part of the semi boreal coniferous belt and is about 4,4 million hectares big and the total forest area is about 2 million hectares, 47% of the mainland. Of the 2 million hectares about 40% is state owned and managed by RMK. The major aims in Estonian forestry are to manage the forest so that ecological, economic, social and cultural aims are accomplished. In Estonia they divide the forest into three categories: protected forests (preserve biological diversity), protection forests (protect sensitive areas like wetlands etc.) and commercial forests. In the protected forests cutting is not allowed, but in the protection forests some cuttings are allowed (selection thinning, smaller final cutting areas etc.). The most common tree species in Estonia are pine, followed by birch, spruce, alder and aspen. The distribution is shown in diagram 1 below.

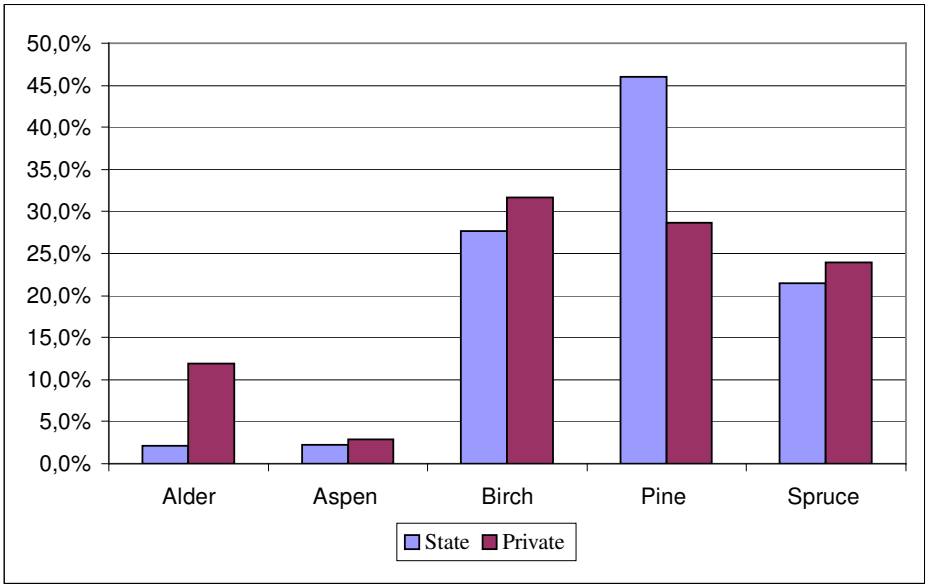


**Diagram 1.** *Estonia's tree species distribution*
Diagram 1. *Estlands trädslagsfördelning*

The general volume of standing forest per hectare in Estonia is 178 $m^3$/ha. The forests in Estonia produce annually 5.8 $m^3$ of timber per hectare. Due to limited cutting and the increase in the area of forests, both the general volume of standing forest and the volume per hectare have annually increased.

According to Metsad (www.metsad.ee) (the center of forest protection and silviculture and also the organization that gives out the Estonian version of forest statistics yearbook) the average regeneration felling volume per hectare in Estonia is decreasing as you can see in table 1 P. Kaimre (P. Kaimre et al 2001) writes, in the conclusions in his report, "that the main problems are procurement of raw material and labor".

**Table 1.** *Regeneration felling in $m^3$/hectare*
Tabell 1. *Föryngringsavverkningar i $m^3$/hektar*

| Year | Regeneration felling |
|---|---|
| 1993 | 241 |
| 1994 | 241 |
| 1995 | 226 |
| 1996 | 221 |
| 1997 | 222 |
| 1998 | 212 |
| 1999 | 197 |

The total volume of regeneration felling in Estonia according to Metsad (www.metsad.ee) has increased during the period of 1993 to 2000 that is shown in *Diagram 2*

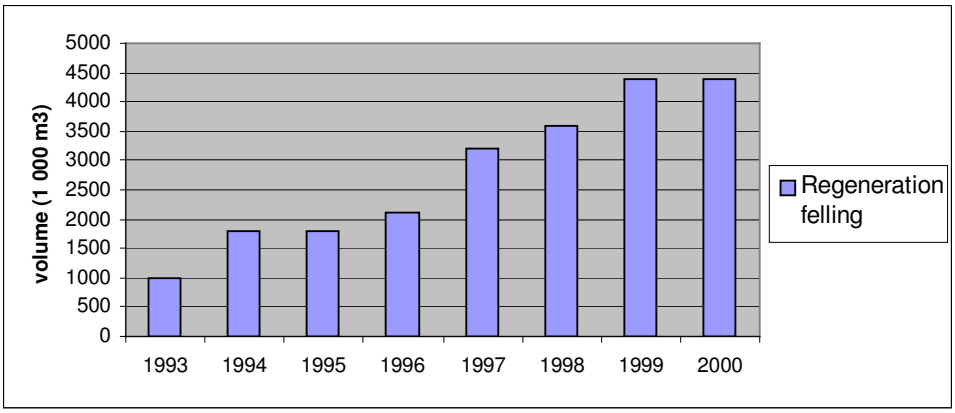


**Diagram 2.** *Estonia's total regeneration felling in 1 000 $m^3$/year*
Diagram 2. *Estlands totala föryngringsavverkiningar i 1 000$m^3$/år*

One quite odd thing about Estonian forestry is that the clear cuts have a regulation in size not only in hectares but also in width. A deciduous stand has a limitation of 5 ha but the clear cut area can not be any wider than 100 meters and for a coniferous stand the limitations are 7 ha and a width of 150 meters. Therefore the clear cuts can be pretty long and narrow. The neighbouring stands can not be harvested until there is a satisfactory regeneration on the clear cut.

The forest in Estonia is regenerated naturally or by planting. In private owned forest natural regeneration is the most common because it is cheaper and the landowner does not have to pay tax for his forestland until the regeneration is over 1,3 meters high. In state owned forest both planting and natural regeneration is used depending on tree species. If you look on diagram 1 you will see that in private forest the share of species that normally regenerate naturally quite well have a higher percentage in private than in state owned forest.
It is common that RMK's forest districts have their own nurseries and this is a tradition that goes long back in history.
Already in the 18th century there was a lack of forest in Estonia and an establishment of forest plantations was applied. Therefore, the artificial regeneration of forests has a history that goes back some 300 years in Estonia.

Forest industry is one of the most important branches of the Estonian economy, representing 17% of the industrial production in net revenues and being the biggest equalizer of the trade balance (Kaimre et al. 2001).

## 1.4 Estonian state forest (RMK)

The Estonian state forest is managed by RMK.
RMK is a governmental profit-making institution that on the one hand has to earn income for the state by logging and selling wood material. On the other hand, RMK has tasks that do not bring direct economic income. These tasks include the maintaining of the unique forest nature and creation of free recreation possibilities. RMK is a big institution and one of the biggest employers in Estonia. There are more than 1.400 people working for RMK, most of them are professional foresters. RMK's headquarter is situated in Tallinn, but the district offices are located all over Estonia. The main operating areas of RMK are forest management, plant cultivation, nature management, hunting management and offering consulting services. Forest management has the biggest part in RMK and have the following tasks to deal with: Surveillance and protection of state forests, sale of timber and pulpwood, planting new forest and maintenance of forest roads etc. About 6,4 million cubic meters were cut in Estonia year 2000 (including all types of felling not only regeneration fellings which are shown in diagram *2*) and about 40,5 % were cut in state forest. The sale of standing forest and timber from cutting made up 95% of the total turnover for RMK in 2000. In 2000, 0.97 million solid cubic meters of standing forest was sold, the average price per solid cubic meter being 149 EEK (1 EEK = 0.58 SEK); the sales volume of round timber was 1.69 million solid cubic meters at an average price of 351 EEK/solid meter (RMK 2004).

The task for the nature management department is to create a sustainable and recreational use of nature in public forests within the limits for what nature can allow without any damage. The forest management in Estonia has been regulated for centuries already; the main purpose of such activities has been the protection of different environmental and nature conservation, social, cultural and recreational values. Strict limits have been established for the forest management.
Over 3% of the total forest area has a main purpose to protect complex environment. The most important areas are national parks, nature protection areas and landscape reserves.
Areas for certain recreational, environmental, educational and research-related limitations have also been established. For all these parts the nature management department is responsible. Only 5% of the protected forests are on the land of private landowners and this shows that the work RMK is doing for nature protection is very important.

# 2 MATERIALS AND METHODS

## 2.1 Method

This thesis is exploratory by its nature, because there is hardly any literature on Estonian logging companies and forestry available in English. Therefore we could not read or plan very much before going to Estonia. We did not have enough information to be able to use a quantitative approach. This because a quantitative study demands knowledge about the subject (Kvale 1997).

Therefore we needed to work with a very open format. We decided to try to do a qualitative approach with interviews where we deliberately selected respondents. This to be able to get logging companies using relatively modern, semi- or fully mechanized logging systems and being evenly distributed in the country. A qualitative method is to prefer when the aim is to understand lines of action and reasoning or understand and see pattern (Trost 1997).

It is very hard to use a qualitative method when you can not understand the language. A qualitative interview is based on a dialogue with the interviewed around the questions and not exactly like we have done it, where we strictly hold on to the questionnaire. The interviews in this study are made in the Estonian language and therefore are we have not been able to adopt a fully quantitative method.

In our study we have collected data from the logging companies in a way that is more quantitative than qualitative. The compilation of data has been both qualitative and quantitative and the interpretation has been quantitative. We have had a questionnaire (*cf. appendix 2)* with questions that were impossible for us to deviate from because of the language difficulties.

## 2.2 Accomplishment of the work

We made a survey of a sample of 9 logging companies distributed across Estonia. A pilot questionnaire was made in Sweden during the planning stage based on our knowledge of Swedish logging companies and the instructions from Skog Forsk *(cf. appendix 1)*. This questionnaire was revised with more questions in Estonia *(cf. appendix 2)*. We also chose to interview Stora Enso in Estonia to get a picture about how a big company works.

To get some help with the practical accomplishment of the work, we contacted two students at the Faculty of Forestry, Estonian Agriculture University, Taavi Petersell and Jaak Raid. They helped us with the selection of which logging companies to be interviewed, the interviews and the translations of the interviews.

The selection of the logging companies is based on the criteria that the interviews should be representative for logging companies using relatively

modern, semi- or fully mechanized logging systems *(cf. appendix 1)*. The companies should also be evenly distributed in the country. Some logging companies were selected from Estonian Forest Industry Association (www.emtl.ee) where many of the logging companies are members. Some logging companies are selected from the knowledge of the Estonian students. The first contact with the logging companies were made by phone by the two Estonian students. It was impossible to accomplish a sample of the logging companies by drawing lots. This because the lack of interview willing companies. Therefore we only interviewed the companies that accepted in the first telephone contact. The sample consists of 9 logging companies. These logging companies log approximately 700 000 $m^3$ of a total of 4 million $m^3$ available for wood supply in the whole country (Swedish forest statistics yearbook 2003). We have chosen not to use the names of the companies, instead we use number 1 to 9. This because that it is not important for the study and because of the anonymity of the logging companies.

The interviews with the logging companies was done by us from Sweden and the Estonian students. We used strictly the questionnaire in appendix 2. The Estonian students were leading the interviews in their language and wrote down the answer. Because of this are not the interviews qualitative. Answers that seemed strange or different compared to the other companies or our knowledge were translated to English directly, so it could be a further discussion about the question. After the interview the answers were translated verbally to us by the Estonian students to English. The interviews were done with the owner or a company manager of each company. Each interview took about 1-2 hours. The results are presented in tables and figures in the Result section and analyzed in the Discussion section.

We also interviewed Stora Enso in Estonia. The interview was done in Stora Enso's headquarter in Tallinn. The language of the interview was English. We had no determined questionnaire, so the interview was more like a dialog about the role of Stora Enso in Estonia.

The questions are made to investigate, analyze and develop a reasonably accurate picture of (*cf. Skog Forsk Paper*) the present state (what kinds of machinery is used, employees, economics etc), problems (what kinds of problems are there in the logging and other areas) and the need for R&D of the logging companies.

# 3 RESULTS

## 3.1 Companies surveyed

Many of the interviewed logging companies are owned by large international forest industries like e.g. Stora Enso. Many of the companies are also trying to become big or bigger forest owners and work with the management of that forest. We will call the companies studied logging companies instead of contractors.

The logging companies are owned by either Estonian private persons or some international forest industry (table 2). However, in the interview with Stora Enso, they mentioned that they are going to sell out their machines to the domestic logging companies and buy in the logging services instead in the same way as in Sweden.

**Table 2.** *Owners of the logging companies*
Tabell 2. *Ägare till skogsföretagen*

| Logging company | Owners |
|---|---|
| 1 | Stora Enso owns Sylvester who owns the logging companies |
| 2 | Three Estonian private persons. |
| 3 | Stora Enso owns Sylvester who owns the logging companies |
| 4 | Estonian private person. |
| 5 | Estonian private person. |
| 6 | Stora Enso owns Sylvester who owns the logging companies |
| 7 | Estonian private person. |
| 8 | Estonian private person. |
| 9 | Estonian private person. |

*Startup of the logging companies*

As you can see in table 3, the logging companies are not older than 11 years and the most recent one is 6 years old. If you compare the numbers of employees with table 15 you see that the numbers of employees have increased since the start.

**Table 3.** *Age of logging companies and number of employees at startup*
Tabell 3. *Ålder på skogsföretagen och antal anställda vid start*

| Logging company | Age of company | Number of employees from the beginning |
|---|---|---|
| 1 | 10 | 30 |
| 2 | 8 | 10 |
| 3 | 6 | 3 |
| 4 | 10 | 4 |
| 5 | 7 | 1,5 |
| 6 | 9 | 1 |
| 7 | 7 | 6 |
| 8 | 11 | 1 |
| 9 | 10 | 5 |

*Size of logging companies*

As you can see in table 4, the interviewed logging companies have grown quite big. They also owns trucks besides forwarders and harvesters.

**Table 4.** *Number of machines within the logging companies and possible plans to increase the number.*
Tabell 4. *Antalet maskiner inom skogsföretaget och planer till utökning.*

| Logging company | Harvesters | Forwarders | Trucks | Increase |
|---|---|---|---|---|
| 1 | 1 | 1 | 3 | No |
| 2 | 1 | 3 | 5 | No |
| 3 | 0 | 1 | 2 | Yes |
| 4 | 3 | 6 | 25 | No |
| 5 | 2 | 2 | 0 | No |
| 6 | 4 | 4 | 0 | Yes |
| 7 | 0 | 2 | 1 | No |
| 8 | 1 | 4 | 3 | Yes |
| 9 | 1 | 1 | 1 | No |

*Geographical working areas*

Table 5 shows the present and future geographical working areas of the interviewed logging companies. Most of the logging companies operate in Estonia but some of them also operate in Latvia. Most of the logging companies do not wish to increase the working area. The problems with operating in other countries are the differences in tax law and in business climate, distance and illegal logging.

**Table 5.** *The working area of the logging companies, possible future expansion and problems connected with expansion.*
Tabell 5. *Skogsföretagens arbetsområde, möjliga framtida områden och problem vid expansion av området.*

| Logging company | Area | Future | Problems |
|---|---|---|---|
| 1 | 300-400 km radius | Increase. Depends on Stora Enso | Crossing the country boarder |
| 2 | 60 km radius | Does not want to increase | No |
| 3 | Estonia and have been to Latvia | Depends on Stora Enso | Boarders, distance, different laws, taxes |
| 4 | Estonia and Latvia | Increase if possible | Differences in the business climate |
| 5 | south-west Estonia | Does not want to increase | Nowhere to expand |
| 6 | Estonia | Does not want to increase | Nowhere to expand |
| 7 | Estonia | Does not want to increase | |
| 8 | Saaremaa | Does not want to increase | Illegal activity in the forest |
| 9 | Around Pärnu | Does not want to increase | |

*Hopes, visions and expectations*

Many of the logging companies have a positive outlook on the future in spite of some big changes, like Stora Enso's out sourcing and the Europe Union membership. All logging companies have some kind of vision about the future, except those who are saying that it is up to Stora Enso (table 6).

**Table 6.** *Hopes, visions and expectations*
Tabell 6. *hopp, visioner och förväntningar*

| Logging company | Hopes, visions, expectations |
|---|---|
| 1 | Depends on Stora Enso |
| 2 | Have 5.000 ha, wants to have 5.000 hectares more forest land |
| 3 | Depends on Stora Enso |
| 4 | Bigger working area and more wood processing |
| 5 | Development of the forest management |
| 6 | Increase volume |
| 7 | Wants to reach 10.000 hectares forest Land |
| 8 | Development of the forest management and nursery |
| 9 | More stability |

*Profitability*

All interviewed logging companies claim in table 7 that they are making a profit on their activity. The estimated future profit is on the same level as the profit they have now. Only one contractor estimated that the profit will be nil. Three could not answer.

**Table 7.** *Present profit and estimated future profit*
Tabell 7. *Nuvarande Vinst och uppskattad framtida vinst*

| Logging company | Profit | Estimated profit |
|---|---|---|
| 1 | 600.000eek | 600.000eek |
| 2 | 700.000eek | 1.000.000eek |
| 3 | 500.000eek | |
| 4 | | |
| 5 | 6.000.000eek | 3.000.000eek |
| 6 | 3.500.000eek | |
| 7 | 7.200.000eek | 7.000.000eek |
| 8 | 2.700.000eek | 4.000.000eek |
| 9 | 350.000eek | 350.000eek |

*Other tasks besides logging*

All studied logging companies have other tasks besides logging (table 8). All logging companies purchase logging objects themselves. They also buy some of the forestland they log. One reason for that is the forest tax. The logging companies manage their own forestland and devote themselves to wood brokerage. Some have their own wood processing.

**Table 8.** *Other tasks besides logging*
Tabell 8. *Arbetsuppgifter utöver drivning*

| Logging company | Other tasks | |
|---|---|---|
| 1 | Secondary transportation and<br>Wood brokerage | <br>130.000 $m^3$ |
| 2 | Forest management and<br>Wood brokerage | |
| 3 | Forest consultation adviser and<br>Wood brokerage | <br>16.000 $m^3$ |
| 4 | Wood brokerage and<br>Wood processing | 150.000$m^3$ |
| 5 | Wood brokerage | |
| 6 | Wood brokerage and<br>Forest management | 100.000$m^3$ |
| 7 | Forest management and<br>buying forest land | |
| 8 | Wood brokerage and<br>Forest management | |
| 9 | Building their own forwarders | |

*Company-owned forest*

As you can see in table 9 some logging companies buy the forestland together with the cutting right. This is why some of the logging companies own quite a bit of land and do a big part of the logging on their own property.

**Table 9.** *Do you buy forestland? How much of the cutting is on your own land? How much forestland do you own?*
Tabell 9. *Köper ni skogsmark? Hur stor del av avverkningen sker på egen mark? Hur mycket mark äger ni?*

| Logging company | Owning and using your own forestland |
|---|---|
| 1 | No Answer |
| 2 | No Answer |
| 3 | No |
| 4 | Yes, 5% of their cutting is on own land |
| 5 | Yes, 25% of their cutting is on own land |
| 6 | Yes, 20% of their cutting is on own land, own 3000 ha |
| 7 | Yes, 50% of their cutting is on own land, own 2300 ha |
| 8 | Yes, Do not buy cutting rights only harvest on own land, own 7000 ha |
| 9 | No |

*Outlook on certification*

There is no certification in Estonia today. There is a huge difference in the opinion about the certification questions. About half of the interviewed logging companies in table 10 are positive and the other half think it is bad. The ones who are positive believe certification will create more orderliness and better regulation in the sector. The ones that disagree with the idea believe that it is political jargon and that it is going to be more bureaucracy.

**Table 10.** *The logging companies outlook to certification*
Tabell 10. *Skogsföretagens inställning till certifiering*

| Logging company | Certification outlook |
|---|---|
| 1 | No problems |
| 2 | Politic scrap |
| 3 | Very positive. Better regulations in the forestry |
| 4 | There is no demand on the market yet, but it is positive |
| 5 | Scrap. But there is no evasion when it is coming |
| 6 | More bureaucracy than necessary |
| 7 | Do not respect the idea. A trend/fashion thing. Scrap |
| 8 | Positive. Customers/consumers are forced to respect the forest |
| 9 | Useless |

*Problems with environmental, forestry and tax legislation and problems that need R&D*

RMK'S *(Estonian state forest department)* logging ban 15 April to 15 June causes problems for the logging companies (table11). In privately owned forests logging is allowed during this time. Most of the interviewed companies in table 11 have some kind of problem with the logging ban.

**Table 11.** *Problems with RMK`S logging ban.*
Tabell 11. *Problem i samband med RMK:s drivningsstopp.*

| Logging company | Problem with RMK`s logging ban |
|---|---|
| 1 | Yes it is a problem. Stagnation in the logging 15 April to 15 June. |
| 2 | The roads are closed.<br>Yes it is a problem. Stagnation in the logging one month. |
| 3 | No big problem, people have their summer vacation anyway. |
| 4 | It is a big problem. Planning gets difficult. |
| 5 | It is a problem that is different every year. |
| 6 | It is a problem that is different every year. |
| 7 | Good influence, we can rent harvesters more easily. |
| 8 | No big problem. Some forest roads are closed. |
| 9 | Yes it is a problem. Stagnation in the logging during the period. |

Many of the logging companies complain about the tax and forestry law (table 12). They think the taxes are too high and that the high taxes promote the black market and illegal logging. The taxes on regenerated logging areas are a problem. One other problem in the forest law is the width and area restrictions of logging objects.

**Table 12.** *Problems with forestry law and tax law.*
Tabell 12. *Problem med skogsvårdslagen och skattelagen.*

| Logging company | Forestry law, tax law |
|---|---|
| 1 | The taxes are too high. Companies sell their products on the black market. |
| 2 | The regenerated logging areas should be free from taxes, and the size of logging area free. |
| 3 | The tax law must become better. Problem with crossing other owners' forest land. |
| 4 | The tax law creates a black market. |
| 5 | The taxes are too high. There is a big black Market and private forest owners do not regenerate. |
| 6 | The taxes are too high. Some parts of the forest law are unreasonable (green thinking). |
| 7 | The high taxes encourage the black market. The size restrictions on logging areas are problematic. Regeneration by force is wrong. |
| 8 | Regenered areas should be free from taxes. The forest law is too strict. |
| 9 | All fine, no problems. |

Other areas where the logging companies saw problems was to find a suitable change of the legislation restricting the logging areas (table 13). Another big problem seems to be finding good employees. Too much drinking of liquor is a problem, especially for the chain saw operators. Finding a solid and trustworthy buyer is also a problem as well as marketing and investment funds for the logging companies. Our study could not find any problem with the machines.

**Table 13.** *Other problems*
Tabell 13. *Andra problemområden*

| Logging company | Other Problems |
|---|---|
| 1 | Hard to get good employees |
| 2 | No problems, besides getting good Employees |
| 3 | Hard to get good employees |
| 4 | Hard to get good employees |
| 5 | The main joint contractor is Unsatisfying |
| 6 | Nothing |
| 7 | Do not know |
| 8 | Finding a solid and trustworthy buyer. Marketing |
| 9 | Investing possibilities are small |

## 3.2 Employees

*Number of employees, years in company and age distribution*

The logging companies have many employees compared to Swedish logging companies. There are still many chain saw operators because it is still cheaper to do most of the thinning and some types of final felling manually. The number of employees according to table 14 includes machine operators, chain saw operators, foremen and office employees.

**Table 14.** *Number of employees, mean years within the company and age distribution.*
Tabell 14. *Antal anställda, medelantal år som anställd och åldersfördelning.*

| Logging company | Nr of employees | Years in company | Age distribution |
|---|---|---|---|
| 1 | 15 | 2 | 25-50 |
| 2 | 37 | | 35-50 |
| 3 | 10 | | 25-55 |
| 4 | 170 | 5 | 30-45 |
| 5 | 25 | 4 | 30-40 |
| 6 | 100 | 6 | 25-50 |
| 7 | 18 | 5 | 21-40 |
| 8 | 17 | 4 | 25-55 |
| 9 | 10 | 8 | 35-45 |

*Changes of employees during the year*

The employment situation is largely stable (table 15). The logging companies seem to be able to deliver enough work for the employees. The only ones that are changing in number of employment during the year are the chain saw operators.

**Table 15.** *Changes of employees during the year*
Tabell 15. *Förändringar av antalet anställda under året*

| Logging company | Change of employees |
|---|---|
| 1 | Stable |
| 2 | Stable but the number of chain saw operators is changing |
| 3 | One operator has quit this year and the number of chain saw operators are changing |
| 4 | Has increased by 30 in three years |
| 5 | Stable |
| 6 | Stable |
| 7 | Stable, but the number of chain saw operators are changing |
| 8 | Stable, but the number of chain saw operators are changing |
| 9 | Stable |

Wages

Table 16 shows the average wages for forest workers per cubic meters. The results show that the wages are low comparative to e.g. Sweden and Finland.

**Table 16.** *Average wages for different working tasks in cubic meters*
Tabell 16. *Medellönen för olika skogsarbeten i kubikmeter*

| Logging company | Harvester | Forwarder | Chain saw operators | |
|---|---|---|---|---|
| 1 | 10 | 10 | | eek/$m^3$ |
| 2 | 13 | 9 | 61 | eek/$m^3$ |
| 3 | | 10 | 60 | eek/$m^3$ |
| 4 | | | | eek/$m^3$ |
| 5 | 8 | 7 | 62 | eek/$m^3$ |
| 6 | 13 | 11 | 70 | eek/$m^3$ |
| 7 | | 10 | 60 | eek/$m^3$ |
| 8 | 22 | 18 | 75 | eek/$m^3$ |
| 9 | 12 | 12 | 67 | eek/$m^3$ |

*Education*

The educational level of the employees seems to be sufficient (table 17) according to almost all logging companies regarding the current technical standard Still, some of the logging companies think it is a problem and would like to offer the employees more education.

**Table 17.** *Educational level of the employees within the logging companies.*
Tabell 17. *Utbildningsnivå bland andställda inom företagen.*

| Logging company | Education level | Problem | Should it be better |
|---|---|---|---|
| 1 | Forest school and operators' course | Yes | Yes |
| 2 | Do not know | | Do not know |
| 3 | Operators' course | No | It is good |
| 4 | Good level | No | It is good |
| 5 | Operators' course | Yes | Yes |
| 6 | Experiences | No | Yes |
| 7 | No special level | No | No |
| 8 | No special level | No | No |
| 9 | No special level | No | No |

## 3.3 Production

*Machine park and service organisation*

The contractors' machine parks and use of service are shown in tables 18, 19 and 20. A couple of the logging companies only have forwarders but most of them have both a harvester and a forwarder.

**Table 18.** *How many harvesters they have, brand, year model, nr of work hours and if it is bought new or used.*
Tabell 18. *Antal skördare, märke, årsmodell, antal arbets timmar och om den är köpt ny eller begagnad.*

| Logging company | Brand | Year | Hours | New/used |
|---|---|---|---|---|
| 1 | Timberjack 1270B | 2001 | 11500 | New |
| 2 | Logman 801/4 | 2003 | **X** | New |
| 3 | **X** | **X** | **X** | **X** |
| 4 | Timberjack 1270 | 2002 | Replaced after 10 000 | New |
| 4 | Timberjack 1270 | 2001 | Replaced after 10 000 | New |
| 4 | Timberjack 1270 | 1999 | Replaced after 10 000 | New |
| 5 | Nokki Profi | 2001 | 14000 | Used |
| 6 | Timberjack 1270B | Max 3 old | Ca 5 000/year | New |
| 6 | Timberjack 770 | Max 3 old | Ca 5 000/year | New |
| 6 | Valmet 911 | Max 3 old | Ca 5 000/year | New |
| 6 | Ponsse HS10 | Max 3 old | Ca 5 000/year | New |
| 7 | Timerjack 1270B | 1999 | 9000 | New |
| 7 | Sampo Rosenlew | 2002 | 2000 | New |
| 8 | **X** | **X** | **X** | **X** |
| 9 | Ponsse Ergo HS | 1986 | **X** | Used |

Table 19. How many forwarders they have, brand, year model, nr of work hours and if it is bought new or used.
Tabell 19. Antal skotare, märke, årsmodell, antal arbetstimmar och om den är köpt ny eller begagnad.

| Logging company | Brand | Year | Hours | New/used |
|---|---|---|---|---|
| 1 | Timberjack 1110 | 2000 | 17 000 | New |
| 2 | Logset F3 | 2001 | **X** | New |
| 2 | Timberjack 810B | 1987 | **X** | Used |
| 3 | Valmet 820 | 2002 | 5000 | New |
| 4 | Timberjack 1110 | 1-4 years old | Replaced after 10 000 | New |
| 4 | Timberjack 1110 | 1-4 years old | Replaced after 10 000 | New |
| 4 | Timberjack 810 | 1-4 years old | Replaced after 10 000 | New |
| 5 | Timberjack 810C | 2002 | Under 10 000 | New |
| 5 | Timberjack 810C | 2000 | Under 10 000 | New |
| 6 | Timberjack 810 | Max 3 old | 6 500/year | New |
| 6 | Timberjack 810 | Max 3 old | 6 500/year | New |
| 6 | Valmet 820 | Max 3 old | 6 500/year | New |
| 6 | Valmet 890 | Max 3 old | 6 500/year | New |
| 7 | Valmet 830 | 2002 | 2 500 | New |
| 7 | Valmet 840 S2 | 1999 | 10 500 | New |
| 8 | Valmet 820 | 2000 | **X** | New |
| 8 | Valmet 820 | 2001 | **X** | New |
| 9 | Metsis | 1998 | 12 000 | own made |

*Machine service*

**Table 20.** *If they use any service organisation, spare part access and if their machines are equipped with extra equipment.*
Tabell 20. *Om de anlitar något service företag, tillgång på reservdelar och om maskinerna är extra utrustade på något sätt.*

| Logging company | Service org | Spare part access | Extra equipment |
|---|---|---|---|
| 1 | Yes, small things they do themselves | Normal, could be better | Chains, bands and painting system |
| 2 | Yes, small things they do themselves | Good | Chains and bands |
| 3 | Yes, small things they do themselves | Normal, could be better | Chains and bands |
| 4 | Yes | Quite good | Chains, bands and plow blade |
| 5 | Yes | Timberjack good, Nokkia could be better | Chains and bands |
| 6 | Yes, small things they do themselves | Good | Chains, bands and painting system |
| 7 | Yes, small things they do themselves | Quite good | Chains, bands and painting system |
| 8 | Yes, after warranty all themselves | Good | Chains |
| 9 | Made on there own | Good | No |

*Production in cubic meters*

Table 21 shows how much each contractor produces per year and the minimum demand each month to break even result. Some of the logging companies purchase timber from other logging companies.

**Table 21.** *Production/year, amount of purchased timber and minimum demand for break even result.*
Tabell 21. *Produktion/år, andel köpt virke och produktionsnivå för att uppnå full kostnadsteckning.*

| Logging company | $m^3$ / year | Bought | Demand/month |
|---|---|---|---|
| 1 | 70 000 | | 4 500 |
| 2 | 65 000 | | 4 000 |
| 3 | 30 000 | 10 000 | 5 000 |
| 4 | 150 000 | 150 000 | / |
| 5 | 60 000 | | 3 333 |
| 6 | 200 000 | | 12 000 |
| 7 | 50 000 | | 5 500 |
| 8 | 50 000 | | / |
| 9 | 15 000 | | 800 |

*Income and cost by cubic meter and the possibility to get work*

The competition among logging companies seems to be tough (table 22). t Half of the interviewed logging companies are finding it hard to get work for the machines and the income level is in some cases in level with the costs.

**Table 22.** *Income for clear-cut and thinning, costs and if they find it hard to get work.*
Tabell 22. *Intäkt vid slutavverkning och gallring, kostnader och om det är svårt att få arbete*

| Logging company | Income/$m^3$ clear cut | Income/$m^3$ thinning | Cost/$m^3$ clear cut | Hard to get work |
|---|---|---|---|---|
| 1 | 120 | / | 120 | Yes |
| 2 | 120 | 140 | 120 | No |
| 3 | 120 | 142 | 120 | Yes |
| 4 | 120 | / | 114 | Yes |
| 5 | 145 | / | 120 | No |
| 6 | 130 | / | 130 | No |
| 7 | 125 | 140 | 120 | No |
| 8 | 120 | / | 55 | Yes |
| 9 | 115 | 130 | 100 | Yes |

*Contracts*

The interviewed logging companies do not normally have any long term contracts, a year or more, as in Sweden (table 23). There are many small forest owners and only a few big forest owners. Therefore, there are many small clients with short term contracts, some months, or a single contract on one logging area. RMK (Estonian state forest) provides some long term contracts. Many of the logging companies have their own forest where they can log at times when they do not have any clients.

**Table 23.** *Contracts*
Tabell 23. *Kontrakt*

| Logging company | Contracts |
|---|---|
| 1 | Single contracts |
| 2 | Single contracts |
| 3 | Single contracts |
| 4 | Some longer contracts |
| 5 | Most single contracts<br>RMK gives longer contracts |
| 6 | Single contracts |
| 7 | Single contracts |
| 8 | Some longer contracts |
| 9 | Long term contracts with RMK |

*Work environment and personnel situation*

The managers' opinions on the work environment for the employees in the interviewed logging companies is summarised (table 24). It shows that company managers thinks that the work environment are good and that the operators seems to be satisfied. The table also shows that the number of turns are different between the companies. There is also, due to different reasons, some stress for the operators.

**Table 24.** *Work environment, job satisfaction, , job rotation? number of work shifts? and if the employees find the job stressful.*
Tabell 24. *Arbetsmiljö, om de anställda finner jobbet stimulerande, antal skift och om de finner jobbet stressigt.*

| Logging company | Work environment | Satisfaction | Nr of shift | Stress |
|---|---|---|---|---|
| 1 | Good, new machines | Satisfied | 3 | No |
| 2 | Good | Satisfied | 2 | Not in work, stress is from home |
| 3 | Good | Satisfied | 3 | If they do not have work they are stressed, its stressing to be poor |
| 4 | Good, new machines | Probably | 3 | Have talks with the employees every 6 months |
| 5 | It can always be better | Quite satisfied | 1 | They have had some but not anymore |
| 6 | Good | Satisfied | 3 | No |
| 7 | Good | Relatively satisfied | 3 | No |
| 8 | Quite good | Satisfied | 1,5 | Some |
| 9 | Sufficient | Sufficient | 1 | No |

*Subcontracting other logging companies or persons - problems*

The logging companies often hire/temporarily employ other logging companies and manual labor (table 25). One problem is the low quality of the work provided by the hired/temporarily employed logging companies and manual labor.

**Table 25.** *Hiring other logging companies or persons.*
Tabell 25. *Inhyrning av andra företag eller personer.*

| Logging company | Contractor or person | Problem |
|---|---|---|
| 1 | Some Chain saw operators | Low quality |
| 2 | One tractor for extraction | No |
| 3 | Chain saw operators, sometimes one forwarder and one harvester | Low quality |
| 4 | Using other contractors for 50% of the whole volume | No |
| 5 | Some times, depends on the season | Low quality and dead lines |
| 6 | Yes, and it increases. But chain saw operators decrease | No |
| 7 | Occasionally | No |
| 8 | Some, decreases in the future | Low quality |
| 9 | No | |

Cross cutting instructions

Most of the logging companies do their cross cuttings by the demand from sawmills or buyers, the most profitable length and diameter (table 26). The use of some kind of optimising program is almost inexistent.

**Table 26.** *Cross cutting instructions, use of optimising program?*
Tabell 26. *Apteringsinstruktioner, om de använder optimerings program?*

| Logging company | |
|---|---|
| 1 | By diameter and price, no optimising program |
| 2 | Sawmills demand, no optimising program |
| 3 | Length and diameter |
| 4 | Optimizing program |
| 5 | According to the most profitable contract |
| 6 | Optimizing program |
| 7 | By diameter and length, no optimising program |
| 8 | According to demand |
| 9 | According to demand |

Feedback

Most of the logging companies find it very important with feedback both within the company and from customers (table 27). Almost all of them want more feedback and are trying to use it for improvement in the company.

**Table 27.** *Feedback*
Tabell 27. *Feedback*

| Logging company | Feedback |
|---|---|
| 1 | Mostly positive feedback and would like more of it. |
| 2 | Have a feedback system in their company. |
| 3 | Mostly positive feedback and thinks it is good with all feedback. |
| 4 | From costumers mostly positive, have some kind of feedback in the company and are working with it. |
| 5 | Mostly positive but wants more of it. |
| 6 | Some kind of feedback, and are trying to work with it. |
| 7 | Mostly inside the company thinks it is sufficient. |
| 8 | Mostly inside the company. |
| 9 | The feed back from RMK is god and do not want more. |

# Stora Enso

*The interview with Stora Enso in Estonia*

Stora Enso is one of the biggest buyers of wood in Estonia, with 400 employees including the logging companies. Stora Enso has bought up the logging companies that they needed for the logging operations. The reason is that the domestic logging companies could not afford the equipment that was necessary for a rational logging. Stora Enso invested in modern equipment. Stora Enso owns through logging companies 10 harvesters, 17 forwarders and 25 trucks in Estonia. Stora Enso is now planning to sell all logging companies except two of the biggest and most successful to retain price control. Stora Enso will offer the logging companies long term contract for the logging, as it does in Sweden. The quality of the logging companies fluctuates much, therefore the logging companies that Stora Enso will hire after the out sourcing must be improved. This way they can hire/contract the logging companies that can live up to Stora Enso's demands. Stora Enso's average cost for the logging is 120 eek/$m^3$ under bark.

Stora Enso has their own sawmills in Estonia. These saw mills are among the world's most profitable. The company is not planning to build any more sawmills but it is going to increase the volumes in the existing ones. The export from Stora Enso in Estonia, mostly to Sweden and Finland, is around 600.000$m^3$ under bark birch pulp wood, 300.000$m^3$ under bark spruce pulp wood and 250.000$m^3$ under bark pine pulp wood. The quality of the export is very high. Stora Enso thinks that certification should be a good thing and is necessary for the forestry in Estonia. The logging companies that work together with Stora Enso will be certified under Stora Enso's organization. Stora Enso thinks that the biggest problem in the forestry in Estonia is the tax law . This problem must be solved. Stora Enso's goal is to be the forest owners first choice. The goal should be attained through using good logging companies and by offering the forest owners a whole system solution for their forest estate.

# 4 DISCUSSION

## METHOD

This thesis is exploratory by its nature, because there is hardly any literature on Estonian logging companies and forestry available in English. The companies interviewed were purposely selected, they should be using relatively modern, semi- or fully mechanized logging systems. Our sample may therefore not be representative for the whole population of Estonian logging companies. The results are indicative and should be considered as indicative. It might be that the results show the picture of the better and therefore more open minded domestic logging companies.

The collection of data in this study is not really qualitative. This because we have strictly followed the questionnaire because of the language difficulties. The language difficulties has also made the dialog around the questions, that are used in a qualitative interview, impossible for us. It is not a quantitative collection of data either. This because we did not have enough information in the planning stage for a quantitative study. We also had a problem getting logging companies that were willing to be interviewed. So getting a statistically reliable sample was impossible for us. Given these limits our results show a promising picture of Estonian forestry.

The work up in a qualitative study are based on the dialog in the part that you collect the data. We had no dialog with our logging companies. We have just the answers from the questionnaire that we have presentate in the Result chapter.

In spite of those complications the work has a qualitative approach. Jan Trost writes in the book “Kvalitativa intervjuer” That there are no pure quantitative interviews (read the Method in the Material and Method shaper).

### Need for R&D

We have managed to get a good picture of the present state and the problems that the logging companies have. We have not succeeded with the aim that was to get knowledge of the R&D needs of the logging companies. The reason for this is probably that the interviewed logging companies did not know themselves what kind of R&D that are needed and it will take a lot more time to investigate this question than the interviews we made. The problems with e.g. the forest law and tax law are problems that are present during the daily management of the company and are therefore more easy for the interviewed to describe.

# PRESENT STATE

## Owner/company

The interviewed logging companies are characterized by their broad working areas. They perform tasks from logging and secondary transports to wood processing. Many of the companies are also trying to become big or bigger forest owners and are working with the management of their own forest.

Many of the logging companies are owned by an international forest industry. One explanation for this is that the domestic logging companies could not afford the expensive equipment and the forest industries were interested in the wood that Estonia has. Is this the economically most effective way to organize the logging? Would it have been better to let the domestic logging companies finance their own companies and perhaps use more labor demanding and less capital intense methods for some time? The future outlook in this question is mostly dependent on the wage level of the Estonian workers. If you look at the Estonian wage level today and compare it with the Swedish level, you will see that the Estonian level is much lower. Maybe it would be cheaper logging if the logging companies had cheaper machines with higher repairs and wage costs instead of the expensive machines that they have today. Perhaps the foreign forest companies and domestic logging companies made the wrong choice by introducing too fast and too expensive mechanization.

The foreign ownerships of the logging companies are on their way to disappear. This is not an Estonian phenomena, in both Sweden and Finland the forest industries are outsourcing the logging. The forest industries are concentrating on the wood industry and they think that the quality of the logging can be improved and the cost decreased by hiring the logging from competing logging companies.

## Production

The machines of the interviewed companies are much newer than we expected. One reason for this is the history of the ownership that was discussed in the earlier passage. The prices of final felling and extraction to roadside are relatively high compared to Sweden, 120 eek/$m^3$ (70 sek), taken into consideration the cost and price level differences of labor between the countries. An explanation for this might be the restrictions on the final felling areas where large areas of final felling can not be logged in one logging operation. This because the total area and shape will exceed the size admitted according to the forest law. However, the most important reason for the high price is probably the structure of ownership of the forestland. A large part of the Estonian forest is owned by private persons or small companies like the logging companies. This will influence the planning of the logging operations. It also results in a lot of unnecessary movements of the machines which is costing a lot of money. The logging companies have a harder time to build up a stock of logging areas. The logging ban in the state forest during spring also complicates things with the logging. One other reason might be that the silviculture, especially thinning, has been neglected -by Swedish standard- the last decades. This brings consequences such as the average standing stock is smaller than in Sweden and, thus, the cost per cubic meter higher.

State forest gives some logging companies long term contracts, but most of the interviewed logging companies have only short term contracts. This makes the planning of the logging operations harder and more expensive. For example, during the wintertime, it is good to have some saved logging areas that are solid and compact.

## Personnel and education level

The interviewed logging companies are relatively big employers. One reason for this is that some thinnings are still done manually with chainsaw due to cost reasons. The number of employees will probably decrease in the coming decade because of the increasing wages in Estonia. The wages and prices will probably increase fast in Estonia during the coming years after the membership in The European Union. The education and labor skills is for many logging companies a problem. Only three out of the nine studied companies have employees with some kind of forest school level or operator's course. This will most likely become a bigger problem in the future. Higher knowledge in silviculture, environmental knowledge, decentralized working tasks and higher technical standard are all demands for the future. The higher demands from the contracting company will be satisfied by higher educated employees in the forest logging company.

# PROBLEMS

Many of the logging companies are complaining about the forest taxes. The high taxes provide a black market in the forest sector which makes the competition very hard for the law-abiding logging companies. The black market also makes it harder to compare prices between buyers and to get an average price for the wood in one region. The volumes that are illegally logged never show up in any statistic calculations, which makes it difficult for e.g. the government to have a supervising role. There are also taxes on forestland, but not on logged areas without 1,3 meter regeneration. That makes the regeneration even more expensive and many private forest owners choose not to regenerate the logging sites. This tax problem is probably the reason why some of the agriculture land- that should be suitable for forestry- is not being planted and used for forestry. The problem with the restrictions on the logging areas´ length and width is probably one of the biggest problems for the logging companies. The result is that it is very hard to plan an economically rational logging site and to have a rational division according to site index.

Other problems are marketing and trustworthy customers. The small Estonian wood processing companies should try to unite in their efforts to do the marketing and sales to foreign customers. This way they could reach bigger and more demanding customers. They could offer the customers more stable, trustworthy and specially made deliveries. There are many small specialized saw mills that can deliver small and very specialized ranges of dimensions.

The parts that the logging companies held as their biggest problem, in this subject field of report, are the legislation restricting the logging areas and the possibility to find good employees. The shape of the logging areas is a big problem that makes the logging very irrational and expansive. The problem with finding good employees is discussed in the personal chapter.

It is very positive that there are no logging companies that have complained about the machines or the organization behind the machines, like service and spare part accessibility.

# FUTURE

The Estonian companies have a different outlook on the future compared to the Swedish logging companies. This is because the Estonian companies are bigger and operate in the whole chain from tree to the finished product which is different from how it is done in Sweden. For example, some Estonian companies have timber trucks, forestland and saw mills within the company and believe that the investments are better in those areas.

Many of the logging companies want to own more forest. This is probably a way for the companies to get more work for the machines during the whole year. It also allows the machines to work during the logging ban in the state forest. A possible negative side to the forest investments is that the invested money maybe could have been invested in more adapted equipment or knowledge that could have given the forest operation company an advantage over other companies.

# 5 SAMMANFATTNING

Syftet och målet med detta arbete är att förse våra uppdragsgivare med information om läget och utvecklingsbehoven hos de Estländska avverkningsföretagen. Vi har valt att använda oss av enkät till 9 avverkningsföretag med hög mekaniseringsgrad. Detta eftersom våra kunskaper om det estländska skogsbruket och dess avverkningsföretag i det inledande skedet av arbetet var minimala. Syftet från uppdragsgivarna var också inte att kvantifiera utan att beskriva avverkningsföretagen. Totalt gjorde vi 9 kvalitativa intervjuer, oftast med ägaren eller någon sorts ledare av företagen. Intervjuerna har styrts mot de företag som är framstående och har relativt moderna maskiner och avverkningsmetoder. De intervjuade avverkningsföretagen avverkar totalt 700.000 $m^3$fub av totalt 4 miljoner $m^3$fub i Estland.
Efter som vi inte gjort någon kvantitativ undersökning kan vi inte säga att detta är den korrekta bilden av hela den estländska populationen avverkningsföretag utan att arbetet beskriver den sortens och de företag vi besökt.

Det som utmärker våra avverkningsföretag är det breda arbetsfältet, man borde kanske beskriva en del av dem som skogsföretag istället för avverkningsföretag. Somliga bedriver allt från avverkningar till vidaretransporter till industri och i vissa fall även vidareförädling och virkeshandel. De flesta köper också mycket skogmark och ser det som en del i sitt skogsföretag.

Det som främst förvånat oss är de moderna maskinerna som finns i Estland idag. En anledning till detta är att utländska skogsbolag gick in i Estland efter frigörelsen från Sovjetunionen och köpte upp avverkningsföretag. De moderniserade dessa så att de på ett rationellt sätt kan förse industrierna i Estland och de närliggande länderna med skogsråvara. Dock bör påpekas att det också finns inhemskt ägda avverkningsföretag med liknade standard. Detta utländska ägandet är dock på väg att försvinna till förmån för de inhemska ägarna. Anledningen till detta är att de utländska skogsbolagen inte vill binda kapital i skogsmaskiner och att de anser att standarden och kvalitén på det utförda arbetet kommer att förbättras genom ökad konkurrens mellan fler entreprenörer.

De problem som de Estländska avverkningsföretagen såg som de största är vissa delar i beskattningen, Skogsvårdslagen och att hitta bra arbetskraft. Den enligt företagen höga beskattningen leder till ökade illegala avverkningar och virkesaffärer. Det största problemet med Skogsvårdslagen är restriktionerna på avverkningarna som måste underskrida vissa ytmått och ett avverkningsförbud i den statliga skogen mellan 15 april till 15 juni på grund av häckande fåglar. Detta leder främst till fördyrade avverkningar och en irrationell indelning av skogen med hänsyn till ståndortsindex. Vi fick inga indikationer på att det var svårt att få tag på råvara, som det finns att läsa i Baltic Forestry (Kaimre et al. 2001) om Estlands skogsbruk. Det var inte några problem med maskinerna i de företag vi besökte.
De flesta företagen ser ljust på framtiden. Det var lite oroligt i en del företag som stod under utländska ägare, eftersom de inte riktigt visste hur det skulle

bli i framtiden. De övriga hade planer på hur de ville utveckla företaget. En del vill skaffa mer skogsmark, andra vill ha ett större arbetsområde och utöka volymerna.

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# APPENDICES

## Appendix 1, Skog Forsk Terms of Reference

### Aim, objectives and scope

The aim of these studies is to provide a basis for further discussion and planning of co-operative (state & Forestry sector) and applied (problem oriented) R&D programs in the field of forest operations.

The primary objectives of the studies are to deliver reasonably true picture of:

- The role of contractors in the logging sector and society respectively (volumes, numbers, economic factors, social factors, etc)
- The nature of contractors (company history, personal background, employees, turnover, etc)
- The contractors-systems composition (customers relations / deals / partnerships, roles, targets / tasks, technique & methods, decision support, personnel, organization). The attention should here be focused on contractors using relatively modern semi or fully mechanized logging systems, i.e. felling and processing by chainsaw or harvester and off road transport by forwarder.
- The contractors-system performance (volumes, revenues, costs, productivities, equipment, utilization, etc)

These four "pictures" should be described in the following three dimensions:

- Present state
- Development, trends and ambitions/hopes ("visions")
- Development issues (areas, problems/possibilities, etc.) that need special applied R&D support .

A secondary objective of the studies is to establish a Swedish benchmark regarding the present state of the contractors and performance.

# Appendix 2 Questionnaire

*Company*

1. Is the company owned by Estonians or foreign investors?
2. Age of the company and how many employees was there in the start?
3. Number of machines within the company and how many machines would you like to have in the future?
4. The company's working area in Estonia, are you planning to expand that working area and do you see any problems with expanding?
5. Hopes, visions and expectations?
6. How big is profit and how big is the estimated profit?
7. Do the company have other working tasks beside logging?
8. Do the company buy forestland, how much do you cut in your own forest?
9. What do you think about certification?
10. How do the logging ban in state forest effect your company, is it a problem and if so why?
11. Do you see any problems with the forest law, tax law etc. what should be different?
12. Other problems

*Employees*

*13. Number of employees, years in company and age distribution?*

14. Changes of employees during the year?
15. Average wages for different working tasks?
16. Educational level within the company, problem and should it be better?

*Production*

17. Harvesters: brand, year model, hours, bought new or used?
18. Forwarders: brand, year model, hours, bought new or used?
19. Do you use service from outside companies, how are the spare parts access for your machines and are the machines extra equipped in some way?
20. Production /year, bought timber volume, minimum demands / month?
21. Income and costs for the logging and is it hard to get work?
22. Do the company have long or short term logging contracts?
23. Working environment, satisfaction, number of turns, stress?
24. Hiring other contractors or persons and problems?
25. Cross cutting instructions and use of some kind of optimizing program?
26. How does the company work with feedback?